This part of the work we shall hope to see thoroughly revised in a future edition. The figure (10, p. 9) of typical mouth parts of insects is very poor, and the figure (2, p. 4) of the eggs of the lackey moth are certainly not typical of that insect, if they are the eggs of it at all. Several other figures in this section are also very unsatisfactory, such as Fig. 3, showing typical forms of larvæ; in this latter we see no caterpillar, no sawfly larva, and those that are shown are very unnatural. The first chapter deals with the Eriophyidæ or gall mites. The more common species that we find in woods and forests have their galls figured. In reference to the literature consulted and quoted, it is a pity the most important writings on the big-bud mite of Lewis and of Warburton are not mentioned.

There are two chapters on Coleoptera, the first dealing with chafers, long-horns, and weevils, including the troublesome pine weevils (*Hylobius abietis*) and the two Pissodes; we should like to have read a good deal more concerning these and the destructive beech Orchestes (*Orchestes fagi*).

The second chapter, of forty-five pages, deals entirely with bark beetles (Scolytidæ). The wood sculpturing of these destructive insects is shown by means of photographic reproductions. This part of the book is nearly complete, and alone makes it of value to the forester.

Pages 130 to 163 deal with oak galls formed by the Cynipidæ, and the chapter contains a useful synoptic table. Chapter v. deals with sawflies, including descriptions of the injurious pine sawflies (*Lophyrus pini* and *L. rufus*) and the large larch sawfly (*Nematus erichsoni*); the same chapter contains all that is essential for the forest student on the Siricidæ or wood wasps and the strange Megastigmi, parasitic on the seeds of the Douglas and silver firs.

Scale insects or Coccidæ form the subject of chapter vi.; the more important forest species are briefly described, including the ash scale (*Chionaspis salicis*) and the felted beech coccus (*Cryptococcus fagi*). Nothing is said about the great harm done by the former, or any suggestions as to how we may easily check its ravages. Regarding the felted beech coccus, the author writes :—

"A most interesting remedial measure has been brought under my notice at Blagdon, in Northumberland. With an inch auger bore three holes at about equal distances right into the centre of the trunk about three feet from the ground and sloping slightly towards the root of the tree. Into these holes [place] as much ' flowers of sulphur ' as can be conveniently got in and then cork them firmly up with a plug of soft wood. This should be done in autumn and will be found successful."

We may point out that this has been tried frequently, and the coccus has not been affected in the least, except about four inches around the auger holes! A comparatively small number of Lepidoptera are described in chapter vii., but some of the more important ones are mentioned, such as the goat moth, vapourer, winter moth, oak tortrix, pine shoot tortrix, larch coleophora, and the new larch pest, *Argyresthia laevigatella*. The chapter on aphides,

a family of insects at present little understood, contains an account of the pine chermes, six species being detailed and their general effects well illustrated. The recent valuable work of Börner [1] will, however, have to be included in a subsequent edition. Naturally, Diptera take up only a few pages, mostly on gall-flies or Cecidomyiidæ, which cause various deformities or galls on leaves, buds, wood, &c.

Several Psyllidæ are detailed in chapter x., including species on the ash, hawthorn, alder, and box.

There are also chapters on collecting and preparing insects, one on insecticides and general remedies, and also a list of trees with injurious insects.

The subject of beneficial insects is very cursorily dealt with, only four pages being devoted to this interesting part of economic entomology, but the author tells us that "the field of beneficial beetles in forest entomology is rather an unworked one," and probably the same may be said of the other groups, and hence, wisely, a few pages only are allotted to this subject, which is of more interest than any practical importance. There are two points we are very disappointed with in this work, and these are that the author, with all his wide, *practical* knowledge, has not told us, firstly, more of his own ideas, and, secondly, more of how we can prevent and destroy these interesting forest insects, which levy such a heavy toll amongst our forests, woods, and plantations.

Had this been done, the work, coming as it does from such an authority on forest insects and their ways, would have been of much greater value.

FRED. V. THEOBALD.

OUR BOOK SHELF.

An Introduction to the Theory of Groups of Finite Order. By H. Hilton. Pp. xii + 236. (Oxford : Clarendon Press, 1908.) Price 14*s*. net.

IN many ways this book will prove a useful companion to treatises already available; especially, perhaps, on account of the large number of examples which it contains, and the hints for their solution. It may be confidently asserted that no example in group-theory is too elementary to be useful; the subject is on one side so very abstract, while on the other the individual properties of groups are numerous, and the protean disguises of the same group are amazingly varied.

The scope of Mr. Hilton's treatise may be indicated by stating that there is a chapter on Sylow's theorem, one on composition-series, and one on the characteristics of an Abelian group. All the main properties of Abelian groups appear to be mentioned; other groups that receive attention are those of the regular solids, and those known as Hamiltonian, linear homogeneous, and quaternion groups.

The chapter on characteristics is the last one, and does not profess to be more than a preliminary outline; it marks very well the limits of the author's plan, and will serve to induce the student to proceed to the very remarkable papers on this part of the subject by Frobenius, Burnside, and others. It is a pity that Mr. Hilton has not given a reference to these and some other of the most important memoirs; of course, no elaborate bibliography is expected in a work

[1] "Eine monographische Studie über die Chermiden." By Dr. Carl Börner. (Berlin, 1908.)

of this kind, but a select list would be useful to the beginner.

In writing on group-theory clearness is essential, and in this respect Mr. Hilton appears to be successful. Group-theory is so important that every advanced mathematical student ought to know something about its principles and methods. University teachers will now have a text-book which ought to help them in making the subject attractive and popular. A good many years ago Cayley foretold the development of group-theory, and his prophecy has been fully justified. The fact is that all analysis may be brought into connection with group-theory; and not only so, but in making this connection clear, we are submitting the particular subject (theory of numbers, algebraic functions, or what not) to its ultimate logical test, and disclosing its real and most fundamental basis.

It should be added that, with the help of Prof. Burnside, Mr. Hilton has given, by way of appendix, a list of twelve problems in group-theory which have not yet been solved. The best known of these is " Can a group of odd order be both non-cyclic and simple? " A definite answer to this question would give great satisfaction to students of group-theory, and as in the case of problems in higher arithmetic, a novice with a natural gift for these researches may succeed where the veterans have failed. G. B. M.

A Short History of Philosophy. By A. B. D. Alexander. Pp. xxii + 601. (Glasgow: MacLehose and Sons, 1907.) Price 8s. 6d. net.

THE author offers this work as a substitute for G. H. Lewes's well-known "Biographical History of Philosophy," which, if for no other reason than that it was written expressly to discredit philosophy, has too long enjoyed its position as the one British attempt to exhibit the entire course of European speculation. Mr. Alexander does not emulate Lewes's literary brilliance, but he writes for a generation of readers who are willing to take the philosophic view even of philosophy, and to regard it not as a noxious counterfeit of knowledge, but as a necessary complement of positive thought at each epoch of man's history—an indispensable and highly significant part of the form and pressure of the time; such readers will welcome him as a competent and trustworthy guide to the salient features in the evolution of speculative thought.

The accounts which Mr. Alexander gives of the various systems of philosophy are clear and sound, and in all important cases have the vital quality that comes from first-hand acquaintance with the classics of his subject. He has dealt more fully with modern than with ancient philosophy, devoting nearly three-quarters of his book to post-Renaissance thinkers and more than half to writers since Hume. It is, perhaps, to be regretted that so much of the space rendered available by the author's restraint in the earlier stages of his enterprise has been given to German philosophers whose importance is national rather than European. It must be admitted, on the other hand, that the great names have received their due, and that, in particular, the chapters on Hegel will give renewed hope to many an honest student who has found the master himself only a shade more perplexing than some of his English interpreters.

The pages which we grudge to the lesser Teutonic lights might well have been used to make more adequate the author's picture of recent philosophical discussion in this country. The writer of a handbook for students must, of course, be reserved in his treatment of current controversies, but, in the case of a subject like the history of philosophy, he will give point to his whole work by a conclusion in which the

questions of vital contemporary interest are at least indicated and set in their relations to the classical speculative movements. It is to be hoped that Mr. Alexander will find in a second edition of his useful work an opportunity of supplementing it in a manner which would render it still more acceptable to many others besides his scientific readers.

LETTER TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Size of the Mammoth.

SEVERAL references have recently been made in NATURE to the size of the mammoth, and I venture to present some notes on the subject, the result of several years' observation and measurements, principally of North American species.

Three good species of true elephant occur in North America—the northern mammoth, $E.$ *primigenius*; the southern, or Columbian, mammoth, $E.$ *colombi*; and the Imperial mammoth, $E.$ *imperator.* The first of these is the one commonly known as the mammoth, and is the species found in northern Siberia and Europe. This attains a height of about 9 feet or 9 feet 6 inches, though an occasional specimen may exceed this, just as now and then an Indian elephant exceeds the average size of the species. The Columbian mammoth reached a height of 11 feet, and the Imperial mammoth 13 feet to 13 feet 6 inches, being, so far as I know, the tallest species of elephant on record. Unfortunately, the Columbian and Imperial mammoths are mainly known from scattered teeth and odd bones, so that their exact proportions cannot be definitely given, even in the case of the Columbian mammoth, the most complete specimen of which lacks the lower limb bones. It may, furthermore, be said that it is occasionally difficult, if not impossible, to say whether a given tooth belongs to the Columbian or Imperial mammoth, but the typical or full-sized specimen may readily be distinguished.

The three species noted above occupied fairly definite ranges in North America, although there was a great overlapping of their boundaries, particularly between the two southern species. The southern boundary of the northern mammoth roughly follows that assigned to the great North American ice-sheet, and the Columbian slightly overlaps this on the east and west, and in the interior of the continent runs far northwards. The Imperial mammoth is not positively known to have reached the Mississippi River, but extended south into Mexico and west to the Pacific coast. This is a westward extension of the range assigned to the species in the report of the Maryland Geological Survey, and is based on material examined since that report was published.

Referring to the mammoth in the museum of the Chicago Academy of Science, it should be said that this specimen has been restored, all the long bones being lengthened, and that the specimen stands certainly 2 feet higher than it should. It has been painted over, so that it is very difficult to tell where the original bones leave off and the restoration commences. The animal is probably the Columbian mammoth, and it is said that the skull is that of a recent Indian elephant.

Finally, a word might be said in regard to the American mastodon, the size and proportions of which are definitely known. This species rarely reached a height of 9 feet 6 inches, the majority of specimens running about 9 feet; but it was a much more heavily built animal than the mammoth or the Indian elephant, so that a specimen 9 feet 6 inches high would weigh from one-third to one-half more than an Indian elephant of the same height—that is, it would weigh from eight to nine tons.

Brooklyn Institute Museum. F. A. LUCAS.